

The Pay Gap in Temporary Agency Work

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January 22, 2026

Abstract

This paper studies pay differences between temporary agency workers and non-agency workers in Germany using the 2023 Earnings Survey (*Verdienstenerhebung*, VE). We document a sizable raw gap in hourly wages to the disadvantage of agency workers (about 18%). Using a sequence of linear wage regressions based on an extended Mincer-type specification, an Oaxaca–Blinder decomposition, and propensity score matching (“statistical twins”), we find that most of the raw gap reflects compositional differences—in particular differences in tenure, education, and task complexity. Holding characteristics constant, the estimated hourly pay gap shrinks to (near) zero, or even reverses, depending on the method used. Oaxaca–Blinder decompositions reveal that the pay in agency work is less dependent on characteristics like age, gender, nationality and part-time status than in non-agency work, likely reflecting the high coverage of agency workers by collective bargaining.

JEL classification: J31, J50, J71

Keywords: temporary agency work, earnings inequality, wage gap, Oaxaca–Blinder decomposition

1 Introduction

Temporary agency work plays a distinct role in the German labour market. In 2023, around 2% of all employees subject to social security contributions were employed via temporary work agencies (Statistik der Bundesagentur für Arbeit, 2024). Compared with standard employment relationships, agency work is typically characterized by high worker turnover and strong cyclical sensitivity. For many workers, it can serve as an entry point (or re-entry point) into employment—especially for job seekers, individuals at risk of unemployment, and returnees (Lehmer and Ziegler, 2010; Schäfer et al., 2020). At the same time, agency work is disproportionately taken up by younger and male workers, and by workers with foreign nationality or comparatively low formal qualifications (Statistik der Bundesagentur für Arbeit, 2024).

Firms use agency work for a variety of reasons. A prominent motive is to adjust labour input flexibly in response to temporary demand fluctuations. Agency work can also be used to bridge short-term absences, to cover production peaks, or to screen workers before offering regular jobs. This latter “screening” or “stepping-stone” role has been documented in a number of empirical studies; for Germany and related contexts, see, for example, Hveem (2013) and Jahn and Rosholm (2014). Related contributions for Germany discuss the role of temporary agency work in firms’ adjustment and labour market dynamics (Walwei and Muschik, 2023; Baumgarten and Kvasnicka, 2017; Jahn and Bentzen, 2012). Moreover, in firms with a moderate use of temporary agency work, productivity gains may arise because agency workers can be deployed flexibly and existing resources can be utilised more efficiently (Hirsch, 2016; Nielen and Schiersch, 2016; Hirsch and Müller, 2012).

Despite these potential employment benefits, the wage position of agency workers has long been debated. A recurrent finding in the literature is that agency workers earn less than comparable non-agency workers, although the magnitude of this disadvantage differs across datasets, periods, and wage concepts (Bachmann et al., 2024; Baumgarten and Kvasnicka, 2017). In the German institutional context, wage comparisons require particular care be-

cause agency work is subject to specific regulation (*Arbeitnehmerüberlassungsgesetz*, AÜG) and, importantly, is characterized by very high collective bargaining coverage. In evaluation work, collective agreements have been documented to cover a large share of establishments, and agency workers are even more frequently covered by collective agreements than comparable workers outside agency work (Brändle et al., 2022). Moreover, agency-sector collective agreements typically stipulate a 35-hour workweek, which is below average weekly hours in the overall labour market. As a result, pay gaps based on monthly earnings can partly reflect differences in paid hours, whereas hourly wages more directly measure remuneration per unit of labour.

This paper therefore focuses on hourly wages and investigates whether a gap in hourly wages between agency and non-agency workers persists once observable differences between the two groups are taken into account. Pay per hour more adequately reflects pay differences than monthly earnings as it represents the “price” per unit of labour paid, whereas monthly earnings are the product of hourly wages and hours worked (“price times quantity”). We use microdata from the 2023 Earnings Survey (VE), which is uniquely suited for this task because it contains both monthly earnings and paid working hours and covers earnings above the social-security contribution ceiling with precision. The VE thus complements administrative datasets frequently used in German labour market research, which often lack information on working hours and therefore do not permit reliable hourly wage calculations.

Our study updates related analyses by Bachmann et al. (2024) who used the predecessor of the Earnings Survey, the Structure of Earnings Survey (*Verdiensterhebung*, VSE) for the year 2018 to study wage differences between agency and non-agency work in Germany. Apart from updating results for earlier years, our empirical findings are based on a substantially more reliable database as firms in the 2023 Earnings Survey were obliged to report wages for *all their employees*, whereas they only had to report wages for a (potentially small) subset of workers in the previous Structure of Earnings Survey.

Bachmann et al. (2024) showed for 2018 that wage differences between agency and non-

agency work were substantially reduced when differences in worker characteristics were taken into account. The present paper shows that, by 2023, there were generally no significant differences in hourly pay for given worker and job characteristics between agency and non-agency workers. In some specifications, we even find the previously observed pay gap had reversed in favor of agency work after accounting for characteristics. We also extend the evidence in [Bachmann et al. \(2024\)](#) by providing a more detailed analysis of the contributions of individual factors on pay differences between agency and non-agency workers based on standard decomposition techniques.

2 Data

2.1 The 2023 Earnings Survey (Verdienststerhebung, VE)

Our analysis is based on the 2023 Earnings Survey (*Verdienststerhebung*, VE), conducted by the Statistical Offices of the Federation and the German states ([Statistische Ämter der Länder und des Bundes, 2023](#)). The VE replaced the earlier Structure of Earnings Survey (VSE) from 2022 onward and relies on a similar but expanded design. A key innovation of the VE is that establishments included in the survey are required to report information for *all employees* rather than for a random subsample. This yields a very large and informative dataset covering roughly 8.8 million employees in about 64,800 establishments.

The VE is the only large-scale German micro dataset that simultaneously provides detailed information on monthly earnings and paid working hours, which allows the construction of hourly wage measures. By contrast, administrative data sources such as those of the Institute for Employment Research (IAB) do not contain reliable working-hours information because their primary purpose is to determine social-security contributions and entitlements.

Given the statutory obligation for sampled establishments to participate, the Earnings Survey (*Verdienststerhebung*, VE) is expected to exhibit high data validity. A further important reason for the high validity of the data is that, in most cases, the reported information is

automatically extracted from establishments’ internal human resources and payroll systems. This applies in particular to information on pay, working hours, and characteristics of the establishment and the employment relationship. Potential limitations may arise only for variables such as qualifications if establishments do not keep employee records sufficiently up to date. If such a problem exists, it would also affect other data sources, in particular administrative data held by the IAB.

2.2 Sample definition and key variables

The VE is a survey of establishments with employees subject to social security contributions in economic sections A (“Agriculture, forestry and fishing”) through S (“Other service activities”) according to the German Classification of Economic Activities WZ 2008. Establishments in “Public administration” (section O) as well as most establishments in “Education” (section P) are not surveyed directly. Instead, these sectors are covered via the personnel stock statistics, which do not include the same information as in other sectors. Establishments that do not employ any workers subject to social security contributions but have at least one marginally employed worker are also not surveyed directly. Due to the incomplete or merely imputed information, we exclude establishments in “Public administration” (section O), establishments in “Education” (section P) as well as establishments that do not employ any workers subject to social security contributions from our analysis.

The analyses of the pay gap between workers employed in temporary agency work and workers outside this sector are based on VE April 2023 data. These data include only individuals who received earnings in April 2023, have information on paid working hours, and were in an employment relationship throughout the entire month. Temporary agency work is identified in the VE via a separate indicator for worker agency assignment (*Arbeitnehmerüberlassung*). Importantly, information on temporary agency workers is collected not from the user firms but from the agencies that supply the workers. For our analysis, we use the monthly earnings paid in April 2023, the working hours performed in that month includ-

ing overtime, and a range of additional characteristics described below. In all analyses, the hourly wage is constructed by dividing monthly earnings by the number of hours worked in April, including overtime. All descriptive statistics and econometric analyses are computed using the VE survey weights, which correct for differences in sampling probabilities across units ([Statistische Ämter der Länder und des Bundes, 2023](#)).

For analytical purposes, we further restrict the dataset to mitigate potential distortions from outliers. In particular, we exclude individuals whose monthly gross earnings are either below 150 euros or above 150,000 euros. In addition, hourly wages above the 99th percentile are set to the value of the 99th percentile (winsorizing). These restrictions remove extreme observations that could otherwise substantially affect mean-based comparisons. For the econometric analyses, we take logarithms of both monthly and hourly wages. This transformation serves to approximate the typically right-skewed wage distribution by a more symmetric distribution. Moreover, it facilitates interpreting regression coefficients in terms of percentage effects (i.e., by how many percent the wage of one group differs from that of another).

Although we report only a subset of our full results, we originally carried out our analysis separately for three different subsamples: (i) employees subject to social security contributions – total (i.e., full-time or part-time), (ii) employees subject to social security contributions – full-time only, (iii) marginally employed workers (“mini-job” employment). Marginally employed workers are not included in the other two groups. The second group (full-time workers) is a subset of the first group and represents the core segment of the labor market. In this paper, we mainly report the results for groups (i) and (ii). Complete results for all three subsamples as well as additional analyses for monthly earnings can be found in our technical report ([Biewen et al., 2025](#)).

3 Characteristics of workers in and out of temporary agency work

Table 1 reports descriptive statistics for agency and non-agency workers. Using hourly wages as the basis for comparing agency and non-agency workers yields a raw (unadjusted) pay gap of approximately -18% to the disadvantage of agency workers (columns 1 and 2 of table 1). The gap is slightly larger for the subgroup of full-time employees (columns 3 and 4 of table 1). Figure 1 illustrates heterogeneity in the raw gap by age group and task-complexity level. The disadvantage of agency workers is typically more pronounced for higher task levels and in older age groups, whereas the gap is reversed for younger workers, particularly those with lower task levels.

There are clear differences in personal and job characteristics between agency and non-agency workers (lower part of table 1). Agency workers have, on average, lower weekly working hours, which is particularly pronounced among full-time employees. A plausible explanation is the very high collective bargaining coverage in the agency sector and the widespread use of sectoral collective agreements that stipulate a 35-hour workweek. Agency workers are also systematically different in socio-demographic characteristics and job histories. They are younger on average, less likely to be female, have substantially shorter tenure with the current establishment, and more frequently hold foreign nationality. Finally, agency workers are much more likely to work in low task-complexity jobs (“helpers”) and to have lower levels of formal education. Taken together, these differences suggest that raw wage gaps are likely to be partly driven—and may even be largely explained—by compositional differences between the two groups.

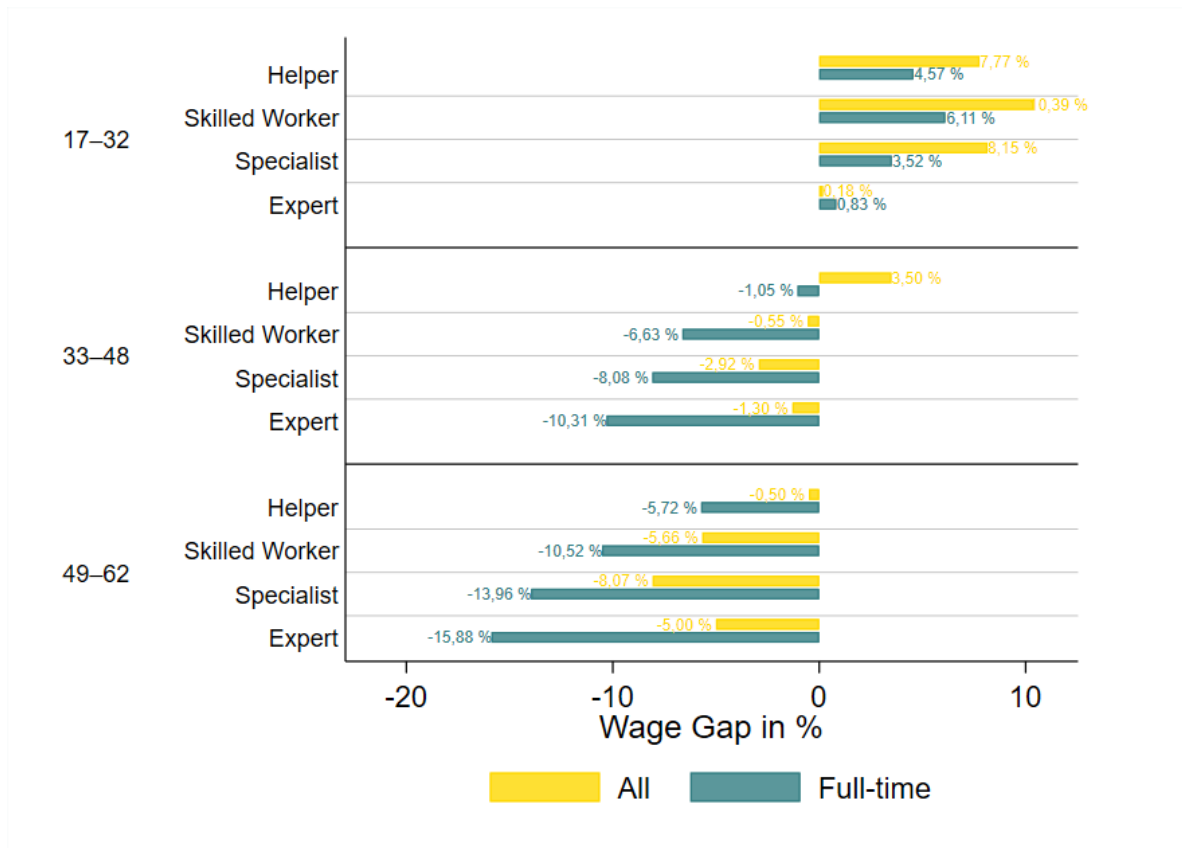


Figure 1: Hourly wage gap within age and task-complexity groups

Notes: The figure reports raw differences in average log hourly wages between agency and non-agency workers within the same age group and task-complexity level. Employees subject to social security contributions (no “mini-jobs”). Source: Authors’ calculations based on VE 2023.

Table 1: Descriptive statistics (means)

	All employees (subject to social security)		Full-time employees	
	Non-agency	Agency	Non-agency	Agency
Hourly wage (euros)	23.59	19.38	24.89	19.16
Weekly working hours	34.09	32.64	38.31	33.76
Full-time indicator	0.69	0.86	–	–
Age	44.47	38.61	43.45	38.65
Female	0.47	0.28	0.32	0.24
Tenure (years)	10.65	1.21	10.58	1.21
<i>Task complexity level</i>				
Helper	0.15	0.60	0.12	0.60
Skilled worker	0.54	0.34	0.54	0.34
Specialist	0.16	0.04	0.18	0.04
Expert	0.14	0.02	0.16	0.02
<i>Education</i>				
Lower secondary (no vocational degree)	0.09	0.40	0.08	0.40
Lower secondary (with vocational degree)	0.54	0.44	0.54	0.45
Upper secondary (no tertiary degree)	0.02	0.03	0.02	0.02
Upper secondary (with vocational degree)	0.15	0.07	0.15	0.07
University / University of Applied Sciences	0.21	0.06	0.22	0.06
Foreign nationality	0.22	0.49	0.21	0.50
Number of observations	7,910,524	102,172	6,146,698	86,395

Notes: Statistics are weighted using VE survey weights. “Agency” refers to employees in *temporary agency work*; “Non-agency” refers to employees outside *temporary agency work*. Tenure is measured in years. Employees subject to social security contributions (no “mini-jobs”). Authors’ calculations based on VE 2023.

4 Econometric analysis of hourly wages

The aim of the econometric analysis is to quantify the part of the pay gap that remains after controlling for observable differences between agency and non-agency workers. We focus on mean-based econometric methods, since the mean is the most informative measure for comparing pay across groups. The mean incorporates all values of the distribution, whereas the median represents only a middle value of the distribution, without taking into account the presence of higher or lower values. The mean is the only statistic that compares differences in overall pay between groups and is thus most appropriate to describe pay differences between groups.

4.1 Linear regression model

We begin with a sequence of linear wage regressions based on an extended Mincer-type earnings function. The baseline specification is:

$$\ln s_i = \boldsymbol{\tau}'\mathbf{X}_i + \lambda z_i + v_i, \quad (1)$$

where s_i denotes the hourly wage of worker i . The indicator z_i equals one if worker i is employed in *temporary agency work* and zero otherwise. The vector $\mathbf{X}_i$ collects control variables commonly used in the wage determination literature (age and age squared, gender, foreign nationality, a part-time indicator, tenure and tenure squared) and is extended stepwise by education, task-complexity level, and occupation. The error term is v_i . The coefficient λ can be interpreted as the (approximate) percentage wage difference between agency and non-agency workers.

For transparency, we estimate the following nested model specifications:

- **Model 1:** No controls (only the agency indicator).
- **Model 2:** Age, gender, foreign nationality, part-time, tenure.

- **Model 3:** Model 2 + education.
- **Model 4:** Model 3 + task-complexity level.
- **Model 5:** Model 4 + occupation (37 occupations, KldB2010).

Figure 2 summarizes the estimated pay gap across specifications. Adding controls substantially reduces the estimated gap and, from Model 3 onward, can reverse its sign. For all employees, the coefficient on the agency-work indicator changes from about -0.18 log points in Model 1 to roughly $+0.10$ log points in Model 4 (i.e., after controlling up to task complexity). Adding occupation (Model 5) reduces this premium again, yielding estimates close to zero. Taken together, the results in figure 2 suggest that hourly pay differences between agency and non-agency workers shrink to zero or even reverse when differences in worker and job characteristics are taken into account.

4.2 Oaxaca–Blinder decomposition

Next, we use an Oaxaca–Blinder decomposition (Blinder, 1973; Oaxaca, 1973) to separate the raw pay gap into an “explained” component attributable to differences in observable characteristics and an “unexplained” component attributable to differences in coefficients (returns) and unobserved factors.

Let $\bar{\mathbf{X}}^A$ and $\bar{\mathbf{X}}^N$ denote the vectors of mean characteristics for agency workers (A) and non-agency workers (N), and let $\hat{\beta}^A$ and $\hat{\beta}^N$ denote the corresponding estimated coefficient vectors from separate wage regressions. We focus on the decomposition variant that uses the coefficient vector of *group 1* as the reference, where group 1 is the non-agency group (see Jann (2008)). We use the Oaxaca–Blinder variant that evaluates the “explained” component at the non-agency wage structure, i.e., the coefficient vector for non-agency workers is taken as the reference. This is a natural choice as the latter represent the vast majority of the labour market.

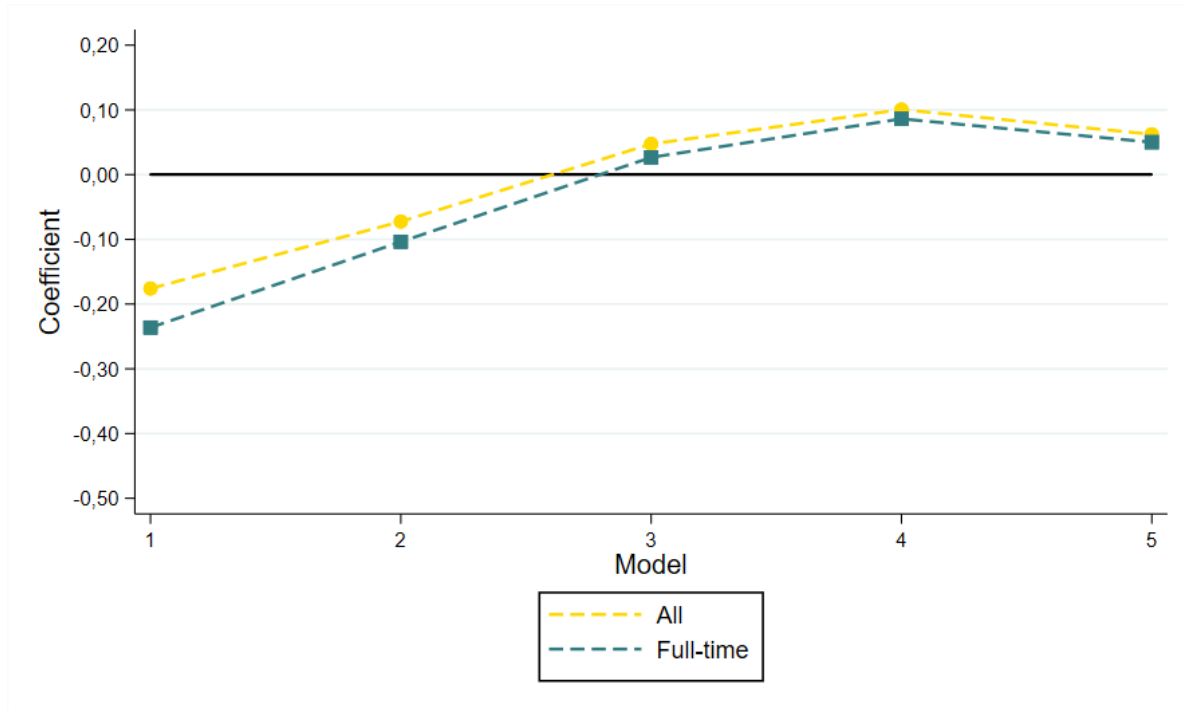


Figure 2: Estimated pay gap from linear regressions (hourly wages)

Notes: The figure plots the estimated coefficient on the agency-work indicator across model specifications. Employees subject to social security contributions (no “mini-jobs”). Model 1: No control variables included. Model 2: Age, gender, foreign nationality, part-time employment, tenure. Model 3: Additionally controls for educational attainment. Model 4: Additionally controls for task level. Model 5: Additionally controls for occupation. All coefficients are statistically different from zero at the 5% level, except for the coefficient for all employees subject to social security contributions in Model 4. Source: Authors’ calculations based on VE 2023.

Defining the average log-wage gap as $\Delta = \bar{y}^A - \bar{y}^N$ with $y = \ln s$, the decomposition can be written as:

$$\Delta = \underbrace{(\bar{\mathbf{X}}^A - \bar{\mathbf{X}}^N)' \hat{\boldsymbol{\beta}}^N}_{\text{explained (characteristics)}} + \underbrace{(\bar{\mathbf{X}}^A)' (\hat{\boldsymbol{\beta}}^A - \hat{\boldsymbol{\beta}}^N)}_{\text{unexplained (coefficients)}}. \quad (2)$$

Table 2 reports a Blinder–Oaxaca decomposition of the hourly wage gap (log hourly wages) between temporary agency workers and non-agency workers for all employees subject to social security contributions, using the richest specification (Model 5), which also controls for occupation. The observed gap amounts to about -0.18 log points, i.e. agency workers earn roughly 18 log-percent less per hour on average. Strikingly, the gap is more than fully accounted for by differences in observed characteristics: the explained component equals -0.24 log points, corresponding to 135.47% of the overall gap. In other words, agency workers tend to have less favorable observable endowments, which by themselves would predict an even larger hourly wage disadvantage. The most important contributors to the explained part are differences in task level (54.17% of the gap), tenure (47.50%), and education (30.25%). Differences in occupations contribute as well, but are comparatively small (6.15%), indicating that occupational sorting explains only a limited share once the broader job and worker characteristics are controlled for.

The “unexplained” component in Table 2 sheds light on how differences in the remuneration of observed characteristics contribute mechanically to the overall hourly wage gap. The coefficient effects for age and gender tend to *widen* the gap, whereas differences in the remuneration of foreign nationality, part-time work, and tenure *narrow* it. The contributions of education and task level are comparatively small in the unexplained part in this specification. The dominant factor is age, which in this context proxies labor market experience. Temporary agency workers are remunerated markedly less for a given age/experience profile than non-agency workers. In Table 2, this mechanical contribution of the age coefficient amounts to 211.50% of the observed gap. However, this effect is more than offset by the countervailing contribution of the regression constant (-332.12%). Put differently, while

the age–pay gradient is flatter in temporary agency work, agencies appear to pay a higher baseline component of hourly wages (i.e., wage components not tied to age).

Additional, smaller differences in pay setting concern male gender (29.07% of the gap), foreign nationality (−5.23%), part-time work (−4.47%), and occupation (48.39%). The latter indicates some heterogeneity in how occupations are priced across sectors, although its contribution is not large enough to change the overall picture. The negative contributions for nationality and part-time work imply that these characteristics are penalized less in temporary agency work than outside it. A plausible explanation is that temporary work agencies typically remunerate workers based on collective agreements, which tend to compress pay schedules and limit wage differentiation by individual characteristics.

Overall, the decomposition implies that temporary work agencies pay slightly higher hourly wages for workers with identical observed characteristics, which translates into a countervailing contribution of the unexplained component. In Table 2, the unexplained part equals −35.47% of the observed gap, whereas the gap is explained to more than 100% (135.47%) by the less favorable characteristics of temporary agency workers.

4.3 Statistical twins: propensity score matching

As a complementary approach that avoids functional-form assumptions about the wage equation, we construct “statistical twins” using propensity score matching (PSM, Heckman et al., 1997). The idea is to compare each agency worker to observationally similar non-agency workers by matching on the estimated probability of being employed in temporary agency work.

Let z_i be the indicator for agency work and $\mathbf{X}_i$ the vector of observed characteristics. We estimate propensity scores using a probit model,

$$\Pr(z_i = 1 \mid \mathbf{X}_i) = \Phi(\mathbf{X}_i' \boldsymbol{\delta}), \quad (3)$$

Table 2: Explained and unexplained components of the hourly wage gap using a Blinder–Oaxaca decomposition (all employees subject to social security contributions)

	Coef.	s.e.	(Un)explained (%)
<i>Overall</i>			
Non-agency workers	3.08***	0.00	
Agency workers	2.90***	0.01	
Difference	-0.18***	0.01	
Explained	-0.24***	0.01	135.47
Unexplained	0.06***	0.01	-35.47
<i>Explained component (endowments)</i>			
Age	-0.01***	0.00	6.30
Male	0.02***	0.00	-11.70
Foreign nationality	-0.02***	0.00	8.99
Part-time	0.01***	0.00	-6.16
Tenure	-0.08***	0.00	47.50
Education	-0.05***	0.00	30.25
Task level	-0.10***	0.00	54.17
Occupation	-0.01***	0.00	6.15
<i>Unexplained component (coefficients)</i>			
Age	-0.37***	0.02	211.50
Male	-0.05***	0.01	29.07
Foreign nationality	0.01**	0.00	-5.23
Part-time	0.08***	0.00	-4.47
Tenure	-0.01**	0.00	2.87
Education	-0.01**	0.01	6.38
Task level	-0.01**	0.01	8.14
Occupation	-0.09**	0.04	48.39
Constant	0.58***	0.04	-332.12

Notes: Authors' calculations based on VE 2023. The outcome is the log hourly wage. Employees subject to social security contributions (no “mini-jobs”). Model 5: Age, gender, foreign nationality, part-time employment, tenure, educational attainment, task level, and occupation. *, **, *** denote significance at the 10%, 5%, and 1% level.

where $\Phi(\cdot)$ denotes the standard normal cumulative distribution function. We then match each agency worker to one (or several) non-agency worker(s) with a similar propensity score within the region of common support and compute the average difference in log hourly wages between the matched groups. The computed average is analogous to the term $(\bar{\mathbf{X}}^A)' \hat{\beta}^N$ in the Oaxaca–Blinder decomposition (2), except that the propensity score matching estimator avoids the linearity and homogeneity assumptions underlying the linear regression model. The resulting unexplained hourly wage gap after propensity score matching can thus be directly compared to the unexplained part in the Oaxaca–Blinder decomposition, i.e. $(\bar{\mathbf{X}}^A)'(\hat{\beta}^A - \hat{\beta}^N)$ in equation (2).

Figure 3 illustrates the resulting matched comparisons. Consistent with the regression evidence, matching on socio-demographics, tenure, education, task complexity, and occupation reduces the raw hourly wage gap sharply. For all employees subject to social security contributions, the raw gap of about -18% falls to roughly zero after matching on Model 5 covariates. For full-time employees, the corresponding gap declines from about -24% to around -2% .

Note that, while the linear regression models in the previous section indicated a reversed unexplained hourly wage gap to the advantage of agency workers, the matching results merely suggest that accounting for worker and job characteristics shrinks the gap towards zero. For computing the unexplained gap, we give more credence to the matching method as it avoids the rigid linearity and homogeneity assumptions used in the linear regression models. Note however, that the latter are necessary for a detailed investigation of the explained and unexplained sources of the gap, which is not possible with the non-parametric matching method.

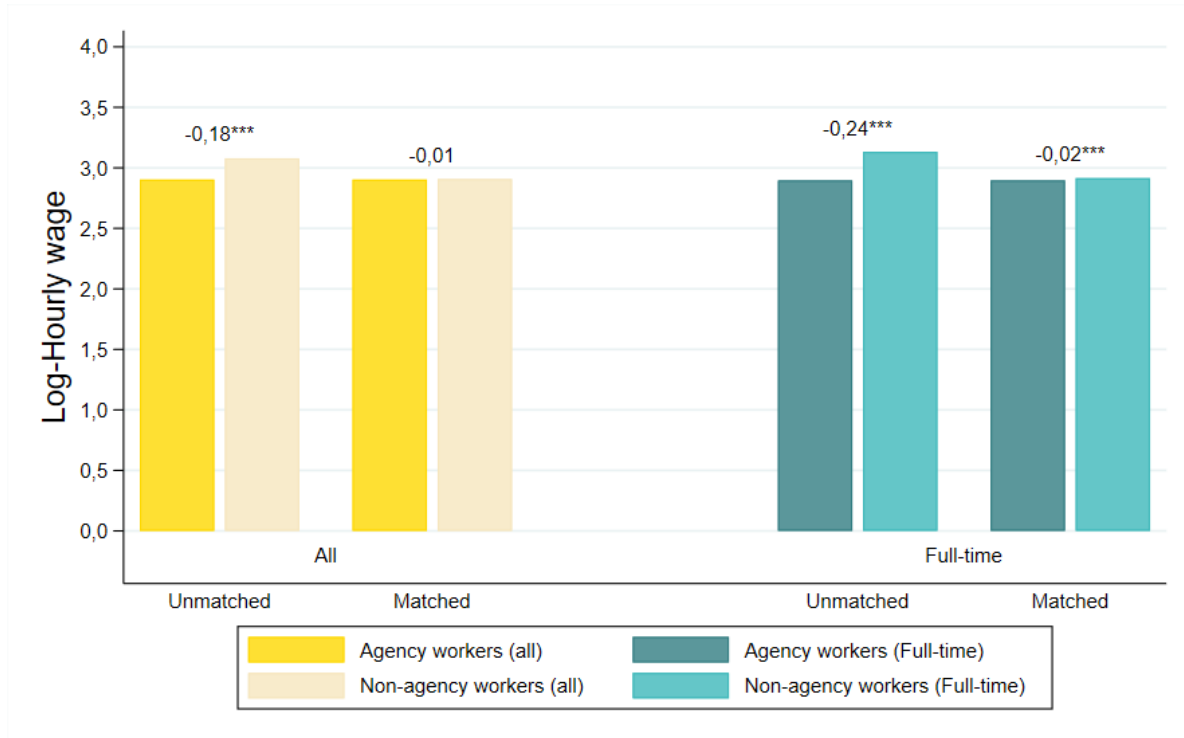


Figure 3: Statistical twins based on propensity score matching (hourly wages)

Notes: The figure compares average log hourly wages between agency workers and matched non-agency workers based on propensity scores. Model 5: Age, gender, foreign nationality, part-time employment, tenure, educational attainment, task level, and occupation. Employees subject to social security contributions (no “mini-jobs”). *, **, *** denote significance at the 10%, 5%, and 1% level. Source: Authors’ calculations based on VE 2023.

5 Summary and conclusion

Using the 2023 Earnings Survey (VE), this paper analyzes the gap in hourly wages between temporary agency workers and non-agency workers in Germany. Hourly wages are, from an economic perspective, the more relevant benchmark for pay differences because they capture remuneration per unit of work. They therefore measure the price, or compensation, per unit directly. By contrast, monthly earnings reflect total revenue (price times quantity) and will mechanically be higher when a greater number of work units are supplied. This distinction is particularly important when comparing earnings in and outside temporary agency work, because temporary agency workers are predominantly paid under sectoral collective agreements due to the high degree of collective bargaining coverage. The standard working time stipulated in these agreements is 35 hours per week, which is below the average working time in the overall labor market.

A descriptive comparison initially yields an unadjusted hourly wage gap of about -18% among all employees subject to social security contributions and about -23% among full-time workers, to the disadvantage of agency work. However, these differences already shrink markedly, or even reverse, when comparisons are restricted to jobs within the same education and task (requirement) level. Depending on the task level, the resulting differentials range between $+4\%$ and -5% .

More comprehensive econometric analyses indicate an almost complete elimination of the hourly wage gap between temporary agency work and non-agency employment once differences in individual characteristics and features of the employment relationship are taken into account. The analyses based on linear regression models even suggest a reversal of the hourly wage gap in favour of agency workers. For example, the Oaxaca-Blinder decomposition in table 2 for all employees subject to social security contributions yields an explained gap of -24% , which, together with the observed raw gap of -18% implies a reversed unexplained pay gap to the advantage of agency workers of around $+6\%$. By contrast, the results based on the more flexible matching method suggests that the unexplained hourly wage gap between

agency and non-agency workers shrinks to zero.

We also find differences in the pay-setting structure of hourly wages between agency and non-agency employment. Pay in temporary agency work varies less with workers' age, gender, and nationality, while the share of a baseline component of pay that is independent of personal characteristics is higher. This pattern is plausibly driven by the fact that temporary work agencies typically remunerate workers under collective agreements, which prescribe standardized pay schedules.

For completeness, we report here the results for marginally employed workers (mini-jobs). Full results for this group can be found in our technical report [Biewen et al. \(2025\)](#). For mini-jobs, temporary agency work is associated with an unadjusted hourly wage *advantage* of up to 32% relative to mini-jobs outside agency work. Accounting for differences in worker and job characteristics reduces this advantage only partly to between 24% (linear regression) and 14% (matching) once occupational differences are additionally controlled for. The share of marginally employed workers among all temporary agency workers in our sample is 5.8% and thus closely matches the corresponding figure of 6% reported in data from the Federal Employment Agency ([Statistik der Bundesagentur für Arbeit, 2024](#)).

Compared with [Bachmann et al. \(2024\)](#), we find that the pay gaps observed in the 2023 Earnings Survey analyzed in this paper are smaller across all specifications than the corresponding gaps reported by [Bachmann et al. \(2024\)](#) for the 2018 Structure of Earnings Survey. We note that the 2023 Earnings Survey can be regarded as statistically more informative than the 2018 Structure of Earnings Survey due to improvements in the survey design.

The finding that temporary agency workers earn the same or even higher hourly wages than comparable workers outside temporary agency work, for similar tasks, highlights both the value of temporary agency work for user firms and the relative competitiveness of temporary agency employment for workers. Firms value the flexibility gained from employing temporary agency workers so highly that they are willing to incur higher short-run personnel costs than under permanent employment relationships. This follows from the fact that

temporary agency workers not only receive similarly high pay per unit of work, but user firms also bear additional service costs (e.g., for recruitment, placement, and administration). From the workers' perspective, temporary agency jobs can be competitive with other employment relationships insofar as they offer comparable or even slightly higher hourly pay for comparable tasks than non-agency employment. However, the lack of long-term attachment to a particular user firm is likely a disadvantage for most workers, and this disadvantage is probably not fully compensated even if hourly wages for comparable tasks in temporary agency work are somewhat higher than those outside temporary agency work. We note that the observed competitiveness of agency work may be a result of the generally strong labour demand during the period studied. The pay gaps observed in some of the previous literature might re-emerge under less favourable economic conditions.

Further implications follow with respect to pay-setting structures in agency work. These appear to deviate in part from average patterns in other segments of the labor market. The likely reason is the existence of sector-specific collective agreements for the temporary agency industry. While collective agreements also apply in other parts of the labor market, they represent only a subset of the wage-setting regimes prevailing in the German labor market. Wage-setting structures that differ from those in the overall market may be advantageous or disadvantageous for temporary work agencies (as well as for other firms covered by collective agreements) in competitive terms. For example, our results suggest that wages paid in temporary agency work depend less strongly on workers' age or experience than in the labor market on average. Holding overall pay levels constant, this implies that younger workers in temporary agency work earn above-average wages, whereas older workers earn below-average wages. As a consequence, temporary agency work may be more attractive for some groups of workers than for others. This raises interesting questions about equilibrium relationships between labor markets within and outside temporary agency work.

Declarations

Funding

The results presented in this article are based on an independent scientific study conducted by the Institute for Applied Economic Research (IAW) [Biewen et al. \(2025\)](#)), commissioned by the Gesamtverband der Personaldienstleister (GVP). The views expressed in this article are those of the authors and not of the Gesamtverband der Personaldienstleister (GVP).

Competing interests

The authors declare that they have no competing interests.

Availability of data and materials

The data used in this study are confidential microdata from the 2023 Earnings Survey (VE) that can be accessed onsite upon application at the Research Data Centers of the German Statistical Offices.

Authors' contributions

Martin Biewen and Philipp Kugler contributed equally to the study design, analysis, and writing. Alexa Weikinger contributed to analysis and writing.

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